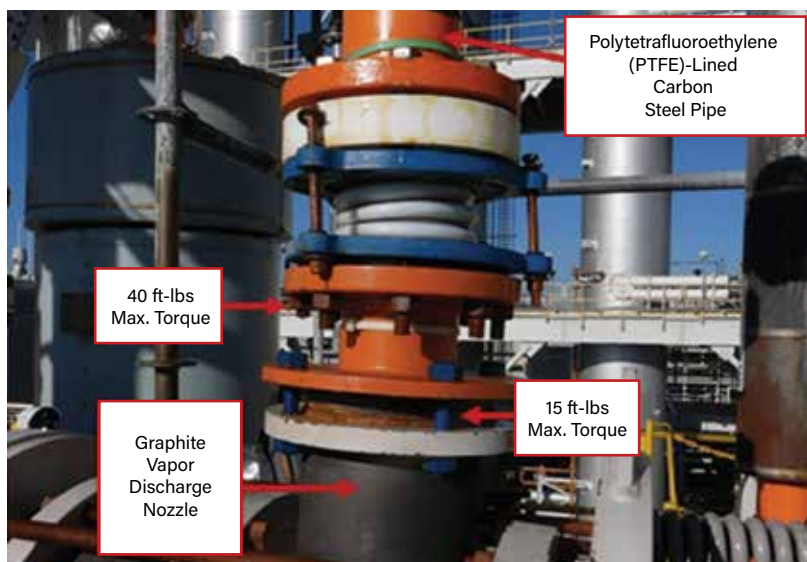


Communication is the Key to Safer Operations February 2025



▲ **Figure 1.** Incomplete instructions were provided to a contractor working on a heat exchanger pipe containing hydrogen chloride (HCl), leading to the contractor applying excess torque to the lower bolts and causing the pipe to crack. Image source: CSB report No. 2021-01-I-TN.

An incident occurred on a 70-ft-tall equipment platform when a contractor pipefitter applied excess torque to tighten flange bolts on a heat exchanger outlet pipe containing gaseous hydrogen chloride (HCl), causing the pipe to crack and release toxic HCl.

Seven workers from two contract firms were on the platform. To escape from the HCl release, three workers attempted to climb down the piping on the side of the structure; all three fell to the ground. One worker was fatally injured, and the other two sustained serious injuries.

Before this incident occurred, the company described the task to the foreman. They provided the manufacturer's equipment manual containing the torque specification of 40 ft-lbs for the bolts on the polytetrafluoroethylene (PTFE)-lined piping (Figure 1). The manual did not include the lower torque requirements for the bolts connecting the PTFE piping to the graphite nozzle on the exchanger. The company provided the piping contractor with a heat exchanger drawing that showed the 15 ft-lbs torque requirement. However, the pipefitters did not have the design drawing with them when they performed the work.

The foreman led the pipefitters to the heat exchanger to verbally review the tasks and indicate the specific piping connections they were to tighten. The workers returned to ground level to prepare for the work, and the foreman left the area. The different torque requirements were not clearly explained, which led to the inadvertent over-torquing of the flange bolts on live operating equipment, and the subsequent equipment fracture and release of HCl.

Did You Know?

- Reducing mistakes involves detailed procedures, training, and, when needed, visits to the area to confirm the details before starting a task.
- Personally inspecting a job site allows one to understand the job and its safety considerations, ask questions, and get answers before beginning a task.
- Written instructions provide portable documentation that can be transported to the job site.
- Verbal communication is the quickest and easiest mode of communication, but it is prone to misunderstanding.
- Unique terminology used by a particular group is called jargon. These terms may have a different meaning for those outside the work group, such as contractors.

What Can You Do?

- Write clear entries in logbooks, round sheets, or other notes. Use equipment descriptions or numbers and avoid abbreviations and jargon.
- Point out critical issues and possible hazards, such as line break locations or hose connections, in the field with those who will perform the work.
- Issue permits to contract workers at the location where the work will be performed. The extra time taken to review the job together may save time in the future and avoid an incident.
- Repeat radio communications with the sender to confirm you understand the message.
- Ask someone if you are unsure how to proceed. It is better to cause a slight delay than a serious incident.

Important information and instructions should be written clearly. Critical issues should be shown.